Course title: Population and Quantitative Genetics
JE 201 (Aug) 3 credits Course

Instructor   : Prof. Amitabh Joshi

ajoshi@jncasr.ac.in

EOBU, JNCASR, JAKKUR,   BANGALORE-64

<u>Outline of the course:</u>
Aug - Dec 2007
ca. 42 hrs lecture; pre-requisites: basic knowledge of Mendelian
genetics, Std. XII level algebra and probability theory; 5-6 homework
assignments, possibly augmented by one open book exam.

Syllabus:
Historical outline of the development of classical population genetic
theory.
Hardy-Weinberg equilibrium for one and two loci and X-linked loci.
Basic models of mutation, migration, viability selection, selection-mutation
and selection-migration balance.
Basic models incorporating temporally and spatially varying selection
intensities.
Breeding systems: inbreeding and assortative mating.
Genetic composition of finite populations: random genetic drift.
Evolution in spatially sub-structured populations; Wright's F-statistics.
Quantitative traits: phenotypic variance and its partitioning. Genetic basis
of quantitative trait phenotypes. Selection on quantitative traits. Genetic
correlations and correlated responses to selection. Maintenance of
quantitative genetic variation in populations. Genotype-by-environment
interactions and plasticity.

Books: Principles of Population Genetics (Daniel L. Hartl & Andrew G.
Clark). Quantitative Genetics (D. S. Falconer & T. F. C. Mackay). The
Origins of Theoretical Population Genetics (W. B. Provine).